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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.         | CONFIRMATION NO. |
|---|-------------|----------------------|-----------------------------|------------------|
| 10/743,638  | 12/22/2003  | Hyeong-Gon Noh       | 51493/DBP/Y35               | 8214             |
| 23363 7590 01/17/2007<br>CHRISTIE, PARKER & HALE, LLP<br>PO BOX 7068<br>PASADENA, CA 91109-7068 |             |                      | EXAMINER<br>WEINER, LAURA S |                  |
|   |             |                      | ART UNIT<br>1745            | PAPER NUMBER     |
| SHORTENED STATUTORY PERIOD OF RESPONSE  |             | MAIL DATE            | DELIVERY MODE               |                  |
| 3 MONTHS  |             | 01/17/2007           | PAPER                       |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

|                              |                               |                            |  |
|------------------------------|-------------------------------|----------------------------|--|
| <b>Office Action Summary</b> | Application No.<br>10/743,638 | Applicant(s)<br>NOH ET AL. |  |
|                              | Examiner<br>Laura S. Weiner   | Art Unit<br>1745           |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2006.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of the additive species where A is O and X is SO<sub>2</sub> and the organic solvent comprising a mixture of at least one cyclic carbonate, at least one linear carbonate and an halogenated benzene in the reply filed on 12-4-06 is acknowledged. The elected species was not found. Therefore, additive species where A is O and X is SO<sub>2</sub> and the organic solvent comprising a cyclic carbonate, a linear carbonate or an halogenated benzene was searched and examined.

### ***Claim Rejections - 35 USC § 112***

2. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is rejected because it is unclear what is meant by "where X is a functional group that includes Y".

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claims 1-5, 8-14, 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Sasaki (JP 2002-319430, translation and abstract).

Sasaki teaches a nonaqueous electrolyte comprising a positive electrode, a negative electrode and an electrolyte containing 1,3,2-dioxathiolane-2, 2-dioxide or a derivative of the same or 1,3-propanediol cyclic sulfate. Sasaki teaches on page 4 of the patent that Formula III (compound with SO<sub>2</sub>) or Formula V (compound with SO) can be used. Sasaki teaches on page 3, [0029] to page 4, [0034], that the electrolyte comprises EC, DEC and LiPF<sub>6</sub> that was dissolved in a solution of 1, 3-2-dioxathiolane-2, 2-dioxide as an additive. Sasaki teaches that 0.5 wt% was added. Sasaki teaches on page 3 of the translation that the negative electrode comprises graphite.

5. Claims 1-5, 8-14, 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Sano et al. (JP 2002-237331, translation and abstract).

Sano et al. teaches on page 5 of the translation a battery comprising a positive active material, LiCoO<sub>2</sub>, a negative electrode comprising graphite powder and an electrolyte comprising PC, LiPF<sub>6</sub> and 5 wt% of 1,3,2-dioxathiolane-2, 2-dioxide.

6. Claims 1-5, 8-14, 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Baek et al. (KR 2001-0086281, abstract).

Baek et al. teaches an electrolyte for a lithium secondary battery comprising a nonaqueous solvent and 0.1-10 wt% of a sulfone-based organic compound such as tetramethylene sulfone. The lithium secondary battery comprises the electrolyte, a

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cathode and an anode comprising carbon, carbon complex, etc. Baek et al. teaches that on page 6-1 of the patent that Formula (II) is used. Baek et al. teaches on page 6-3, that the electrolyte comprises LiPF<sub>6</sub> and EC, DMC, DEC, MEC, etc.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (US 2002/0102466).

Hwang et al. teaches a battery comprising on solvent having a dielectric constant that is greater than or equal to 20 and a second solvent having a viscosity that is less than or equal to 1.3 and an electrolyte salt. Hwang et al. teaches in claim 10, a lithium-sulfur battery comprising a negative electrode comprising a compound that can reversibly intercalate lithium ion, etc.; an electrolyte comprising a first solvent having a dielectric constant that is greater than or equal to 20 and a second solvent having a viscosity that is less than or equal to 1.3 and an electrolyte salt. Hwang et al. teaches in claim 14, that the first solvent can be ethylene carbonate, propylene carbonate, etc. ; the second solvent consisting of methyl acetate, dimethyl carbonate, fluorobenzene and an additive such as ethylene sulfite. The additive is present between 0.2-10% of weight.

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The first solvent is roughly between 20-80% by volume and the second solvent is roughly between 20-80% by volume.

Hwang et al. discloses the claimed invention except for specifically teaching that the first solvent is EC or PC; the second solvent is fluorobenzene and the additive is ethylene sulfite.

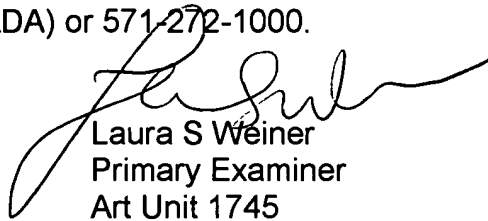
It would have been obvious to one having ordinary skill in the art at the time the invention was made to use EC or PC; fluorobenzene and ethylene sulfite as the electrolyte solvents because Hwang et al. teaches that both these solvents can be used in the electrolyte as explained above and one would expect therefore that these solvents would function in a similar way and give similar results.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura S. Weiner whose telephone number is 571-272-1294. The examiner can normally be reached on M-F (6:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Laura S Weiner  
Primary Examiner  
Art Unit 1745

January 10, 2007